

WHAT IS CLAIMED IS:

1. A GaN-based semiconductor light emitting diode comprising:
a substrate on which a GaN-based semiconductor material is
5 grown;

a lower clad layer formed on the substrate, and made of a
first conductive GaN semiconductor material;

an active layer formed on a designated portion of the lower
clad layer, and made of an undoped GaN semiconductor material;

10 an upper clad layer formed on the active layer, and made of a
second conductive GaN semiconductor material;

an alloy layer formed on the upper clad layer, and made of an
alloy selected from the group consisting of La-based alloy and Ni-
based alloy; and

15 an TCO(Transparent Conduct Oxide) layer formed on the alloy
layer.

2. The GaN-based semiconductor light emitting diode as set
forth in claim 1,

20 wherein the alloy layer has a thickness of 100Å or less.

3. The GaN-based semiconductor light emitting diode as set
forth in claim 1,

wherein the La-base alloy is LaNi₅.

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4. The GaN-based semiconductor light emitting diode as set
forth in claim 1,

wherein the Ni-based alloy is ZnNi or MgNi.

5. The GaN-based semiconductor light emitting diode as set forth in claim 1,

5 wherein the TCO(Transparent Conduct Oxide) layer is made of at least one material selected from the group consisting of ITO, ZnO, Indium Oxide and MgO.

6. A method for manufacturing a GaN-based semiconductor light emitting diode comprising the steps of:

(a) preparing a substrate on which a GaN-based semiconductor material is grown;

(b) forming a lower clad layer, made of a first conductive GaN semiconductor material, on the substrate;

15 (c) forming an active layer, made of an undoped GaN semiconductor material, on the lower clad layer;

(d) forming an upper clad layer, made of a second conductive GaN semiconductor material, on the active layer;

20 (e) removing designated portions of the upper clad layer and the active layer so as to expose a portion of the lower clad layer;

(f) forming an alloy layer, made of an alloy selected from the group consisting of La-based alloys and Ni-based alloys, on the upper clad layer; and

25 (g) forming an TCO(Transparent Conduct Oxide) layer on the alloy layer.

7. The method as set forth in claim 6,
wherein the alloy layer has a thickness of 100Å or less.

8. The method as set forth in claim 6,
5 wherein the La-base alloy is LaNi_5 , and the Ni-based alloy is
ZnNi or MgNi.

9. The method as set forth in claim 6,
wherein the La-base alloy is LaNi_5 .

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10. The method as set forth in claim 6,
wherein the Ni-based alloy is ZnNi or MgNi.

11. The method as set forth in claim 6,
15 wherein the step (f) is a step of growing the alloy layer on
the upper clad layer by a physical vapor evaporation method.

12. The method as set forth in claim 6,
wherein the step (g) is a step of growing the ITO layer on
20 the alloy layer by a physical vapor evaporation method.

13. The method as set forth in claim 6, further comprising
the step of:

(h) thermally treating the TCO layer.

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14. The method as set forth in claim 13,
wherein the step (h) is a step of thermally treating the TCO

layer at a temperature of approximately 200°C or more for 30 seconds or more in an air atmosphere.